U.S. ARMY TECHNICAL CENTER FOR EXPLOSIVES SAFETY

EXPLOSIVES SAFETY

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DIRECTOR NOTES

The war in Southwest Asia (SWA) was a monumental logistics task that serves as an example of how ammunition/explosives can be transported quickly and used safely. It is a tribute to the ammunition community that everyone, from the soldier to the civilian technical specialists committed their expertise and met the challenge of explosives/ammunition safety. Although the conflict is over, the continuing challenge to protect the safety of people and preserve property awaits us. This challenge cannot be left unanswered.

We can never afford to damage or destroy "hard-to-replace", expensive materiel. Now, with the austere outlook starting in FY 92, it is even more imperative to shield those scarce resources from destruction. Accidents such as the one that recently happened in SWA are avoidable. Now, as much as ever, the ammunition community is called upon to persist with its mission to safeguard personnel and preserve property through commitment to operational discipline, user training, and an effective inspection program.

by: John L. Byrd, Jr.
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CHANGES IN DA EXPLOSIVES SAFETY POLICY

A recent memorandum from the Office of the Chief of Staff, U.S. Army (OCSA) has changed DA policy in two areas. These are:

a. Empty ammunition and explosives structures at installations on the Base Closure List will not require lightning protection inspection and test provided the structures are certified empty and secured with a numbered seal. Should the structure be reactivated, the tests and inspections must be performed prior to use.

b. In the last year many Department of Defense Explosives Safety Board (DDESB) explosives safety surveys have cited the lack of an electrical bonding strap connecting the earth-covered magazine door-to-door frame as a deficiency. The DA policy in this regard is as follows:

(1) If the "as built" drawings for the earth-covered magazine required the electrical bonding strap(s), then they must be installed and maintained.

(2) If the "as built" drawings for the earth-covered magazine do not require the electrical bonding strap, one of the following must apply:

(a) If the electrical resistance between the door and the door frame is less than one ohm, then no further action is necessary.

(b) If the electrical resistance between the door and the door frame is greater than one ohm, then corrective action, such as cleaning the door hinge or the installation of the electrical bonding strap, must be implemented.

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EXPLOSIVES SAFETY LESSONS LEARNED

Based upon questions from the field and recurrent errors in Site Plan submissions, it became clear that prior to October 1990 the Army lacked adequate guidance on the preparation of site plans and safety submissions for explosives facilities. Construction approval was delayed while additional required information was prepared and sent to the Department of the Army (DA) and the Department of Defense Explosives Safety Board (DDESB) for their approval. In 1990, U.S. Army Technical Center for Explosives Safety (USATCES) published a Site and General Construction Plan Developer's Guide providing detailed guidance on complete site and general construction plan requirements. The guide provides major Army commands (MACOMs) and installations with checklists for preparing the plans to assure all necessary information is provided for review.

The guide was updated in May 1991 to include new guidance from DA and DDESB. This information is included in the soon to be published DAP 385-64, Ammunition and Explosives Safety Standards. The site and general construction plans now reviewed for submittal to DDESB are of better quality. They require less time for review and approval, thereby shortening the wait by installations and MACOMs. The information provided by the field for getting approval for construction of explosives facilities has definitely improved.

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QUESTION AND ANSWER

Q. Quantity distance (QD) standards allow the storage to physical capacity of Class/Division (C/D) 1.2 and 1.3 "... in earth-covered buildings, provided they are sited on the basis of any quantity of C/D 1.1..." Does this apply to nonstandard magazines?

A. Yes, according to guidance recently provided by the Department of Defense Explosives Safety Board (DDESB) Secretariat.

Q. The QD tables which give inhabited building distance (IBD) and public traffic route (PTR) distance for 1.1 materials have special columns for earth-covered magazines. These columns give smaller distances because they consider the headwall and earth cover. Most magazines have ample distance around them. Some, however, don't and could take advantage of these reduced distance columns. Unfortunately, these columns can only be used for standard magazines which are 26 by 60 ft. or larger. Is there any way we can use these distances for nonstandard magazines? For magazines smaller than 26 by 60 ft.?

A. Yes! For nonstandard magazines, 26 by 60 ft. or larger, the reduced distances shown in the "Side" and "Rear" columns may be used. For front exposures, use the "Other PES" column. For standard or nonstandard magazines smaller than 26 by 60 ft.: If the magazines loading density is less than or equal to .028 lb. of net explosive weight (NEW) per cubic foot. of magazine internal volume, the "Front," "Side," and "Rear" columns may be used. If the loading density is greater than this, use the "Other PES" column for all exposures.

Q. I am from U.S. Army, Europe (USAREUR) and I read an article pertaining to the treatment of magazines with insufficient earth cover for QD purposes. The article stated that magazines with 12-24 inches of earth cover should be treated as barricaded aboveground magazines, and that magazines with less than 12 inches of earth cover should be treated as unbarricaded aboveground magazines. I was wondering if there were exceptions to these rules.

A. Yes, there is one exception.. The USAREUR and Seventh Army types II, III, IIIA, and IV magazines are authorized by the DDESB and are designed for 35 centimeters (about 14 inches) of earth cover. These magazines are authorized only in USAREUR and are not authorized for new construction.

by: Clifford H. Doyle
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EXPLOSION-PROOF LIGHTING FIXTURES IN MAGAZINES

Must all interior lighting fixtures and electrical wiring inside all magazines be explosion-proof? TM 9-1300-206 discourages interior lighting of magazines unless a clear need for it exists. A location that fits the description of a National Electric Code (NEC) Class I hazardous location, must have explosion-proof wiring and fixtures installed. A location that fits the description of a NEC Class II hazardous location, must have dust-ignition-proof wiring and fixtures installed. An NEC Class I hazardous location is where highly flammable gases or vapors are present, like a petroleum refinery. An NEC Class II hazardous location is where combustible dusts are suspended in the air; a grain elevator would be a good example. Ammunition and explosives that are packaged in Department of Transportation (DOT) approved packs do not normally release vapors or explosives dusts that would cause a hazardous atmosphere.

A review of the intended use of the magazine should be made to determine if a hazardous atmosphere could exist. A production facility where powdered aluminum is mixed into molten trinitrotoluene (TNT) would be required to have equipment rated for both NEC Class I and Class II hazardous locations. A surveillance workshop would not need explosion-proof wiring for most operations, but because there is a chance of creating a hazardous atmosphere in some operations, the standard drawings for surveillance workshops require electrical equipment to be rated for both NEC Class I and Class II hazardous locations. A magazine used to store rockets in DOT packs would not require explosion-proof wiring and fixtures.

If the facility is deemed not to need explosion-proof fixtures but will have explosives contained in the structure, then, at a minimum, the electrical service should have sparkproof or industrial rated electrical systems with rigid metal conduits, enclosed junction boxes having closure plates without openings, and protective covers for the lighting fixtures.

by: Gregory S. Heles
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WALL DESIGNED TO PREVENT EXPLOSIVES PROPAGATION BETWEEN TRUCKS UPLOADED WITH ARTILLERY AMMUNITION

The Department of Defense Explosives Safety Board (DDESB) has approved the Agan Steel Panel (ASP) Walling System for separating trucks loaded with any combination of M483 and M107, 155mm projectiles not exceeding a total of 160 and an equivalent number of propelling charges. The wall will allow these trucks to be separated by 15 feet, edge-to-edge, provided there is one ASP wall midway between the loaded vehicles. This walling system could be very useful in places where the distance between trucks is small and additional real estate cannot be obtained.

Basically, the wall consists of specially designed metal panels that are filled with concrete. The U.S. Army Technical Center for Explosives Safety (USATCES), ATTN: SMCAC-ESL, Savanna, IL 61074-9639, will answer any questions regarding the ASP Walling System and provide the technical data packages upon request.

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STATIC ELECTRICITY IN THE DESERT ENVIRONMENT

Southwest Asia (SWA) is a static electricity hazard area. Low relative humidity and dusty conditions contribute to the generation of static electricity. Personnel in SWA should be aware of the hazard and take precautions to eliminate or reduce the static charges.

Here are some things that can be done:

- Do not wear nylon clothing as the outer layer garment. Nylon does not dissipate electrostatic charge very well.
- Do not put on or take off articles of clothing (including hats) in hazardous areas. Separating materials or rubbing them together builds up electrostatic charges.
- Use anti-static laundry additives and anti-static sprays to reduce electrostatic charge. The additive process used in the military laundries works better than those in home laundries.
- Ensure that proper grounding and bonding procedures are used, especially in fuel handling, ordnance operations, combat engineer operations, etc.
- Connect nozzle bonding wires before opening fuel caps to prevent a static spark from occurring in the presence of fuel vapor.
- Personnel can ground themselves by touching a large metal object, if an earth ground is not available.
- Ensure that electrostatic charges are checked for and grounded (on personnel as well as equipment) before handling electrostatic sensitive electroexplosives devices.

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HAZARD CLASSIFICATION CHANGE

In our discussions with U.S. Army Materiel Command Field Safety Activity (AMCFSA), it was confirmed that the Joint Hazard Classification System (JHCS) recently changed the classification on several items which were Hazard Class/Division (HC/D) 1.3. Items with a Department of Defense identification code (DODIC) of M610 and M814 have been changed to a HC/D of 1.4. Note that the classification for items with the DODIC M605 have not all been changed to 1.4. Items with the National Stock Number (NSN) 1375-00-293-8132-M605 remain as 1.3 - all other items with a DODIC of M605 now have a HC/D of 1.4.

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ACQUISITION OF DOD 6055.9-STD, JULY 1984, DOD AMMUNITION AND EXPLOSIVES SAFETY STANDARDS

Supplies of the DOD 6055.9-STD, DOD Ammunition and Explosives Safety Standards, at the U.S. Army Technical Center for Explosives Safety (USATCES) have run out. We cannot provide copies of the basic, change 1, or change 2. We do have supplies of change 3. Copies of the DOD 6055.9-STD can be obtained by calling Defense Technical Information Center (DTIC) at DSN 284-6811 or commercially at (202) 274-6811.

The DTIC order numbers for the DOD 6055.9-STD and changes are:

Basic - AD-A148 685
Change 1 - AD-A199 125
Change 2 - AD-A208 197

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CORRECTIONS TO BULLETIN ARTICLE

An error was noted in the Jan 91 Explosives Safety Bulletin. Paragraph c of the article titled "Quantity Distance (QD) Requirement to Storage Tanks" should have stated that the minimum distance required to aboveground tanks that service several explosives areas will be a minimum of 400 feet for any 1.1 or 1.2 munitions. Inhabited building distance (IBD) will be required from any 1.3 or 1.4 munitions in a similar situation.

USATCES HOTLINE

A 24-hour HOTLINE has been established to better serve the needs of the explosives/ammunition community.

Callers are invited to submit any problems, comments, and suggestions to USATCES, DSN 585-6030.

The Explosives Safety Bulletin targets the ammunition/explosives community. It is printed in Savanna, Illinois.

If you wish to submit an article that is of interest to the ammunition/explosives community, or if you have a request for more copies of the bulletin, please forward it to: Director, U.S.Army Technical Center for Explosives Safety, ATTN: SMCAC-ES, Savanna, Il 61074-9639 or Call DSN 585-8872.

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